CS3130 WIRELESS MOBILE COMPUTING (3-2)

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COURSE OBJECTIVES:

- Learn about the design and implementation of mobile communication systems
- Learn about PDA's (Personal Digital Assistants) and other portable devices
- Learn a functional, object-oriented language designed for development on PDA's
- Integrate wireless networking capabilities with PDA's
- Integrate GPS (Global Positioning System) with PDA's
- Develop a prototype application that exploits the strengths of these technologies
- Learn about application areas for this technology

REQUIRED TEXT:
None

SUPPLEMENTARY TEXTS:

McKeehan, J., & Rhodes, N. (1995). *Wireless for the Newton: Software Development for Mobile Communications*, AP Professional.
McKeehan, J., & Rhodes, N. (1995). *Programming for the Newton Using Windows*, AP Professional.
McKeehan, J., & Rhodes, N. (1995). *Programming for the Newton: Software Development with NewtonScript*, AP Professional.

PREREQUISITES

CS3300 or consent of instructor.

COURSE CONTENT

Introduction

- What is "wireless mobile computing"?
- What isn't "wireless mobile computing"?
  - Mobile Computing
  - Collaborative Computing
  - Distributed Computing
  - Ubiquitous Computing
- Design Issues
  - Whose problem is it solving?
  - Does it enable things we can't do now?
  - What are the technical shortcomings?
    - Data Synchronization
    - Bandwidth Management
    - Display Constraints
    - Memory Constraints

Applications

- Leatherneck
- Handheld computing in the USMC
- Car navigation systems

- Healthcare applications
- Wearable Computing
- Others

Devices
- Thin clients
- Personal Digital Assistants (PDA's)
- Ruggedized Systems
- Portable Displays
- Global Positioning System (GPS)
- Interaction devices
    - Tablets
    - Wireless keyboards
    - Handwriting recognition

Wireless Networks
- Ricochet (Metricom)
- Wireless LANS
- IR communications (IrDA)
- Cellular (CDPD)

Software
- Operating Systems
    - Newton OS
    - Windows CE
    - Magic Cap
- HDML (XML)
- Remote Access
- Agents

Development
- Newton Toolkit
- NewtonScript
- NewtonBasic
- Windows CE SDK
- Pilot development (Metrowerks)

LABORATORY AND COURSE ORGANIZATION

This course is entirely project-oriented. Grades will be determined based on projects students will do in small groups and on an individual presentation each student will give on some topic in this area. We will first discuss the technology, what it can and can't do, and how it will affect the way we think about computing. Student teams will then submit a short (no more than a page) project proposal describing what they will implement for the course. This proposal must clearly define what equipment will be needed, what the system will do, and how we will know if objectives have been met.

Grades for the group project will be determined based on:

(A) The complexity of the project (This does not imply the maximum use of equipment)
(B) The relevance to a real world need or requirement
(C) The meeting of objectives as outlined in the proposal
(D) The size of the group